

UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

iROBOT CORPORATION,

Plaintiff,

v.

SHARKNINJA OPERATING LLC,
SHARKNINJA MANAGEMENT LLC, and
SHARKNINJA SALES COMPANY,

Defendants.

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Civil Action No. 19-cv-12125-ADB

MEMORANDUM AND ORDER ON CLAIM CONSTRUCTION

BURROUGHS, D.J.

Plaintiff iRobot Corporation (“iRobot”) alleges that Defendants, SharkNinja Operating, LLC, SharkNinja Management, LLC, and SharkNinja Sales Company (collectively, “SharkNinja”) are manufacturing and selling several robotic vacuum cleaners that infringe five of iRobot’s patents: United States Patent Nos. 9,550,294 (“the ’294 patent”), 9,492,048 (“the ’048 patent”), 8,950,038 (“the ’038 patent”), 8,418,303 (“the ’303 patent”), and 10,045,676 (“the ’676 patent”). [ECF No. 84 ¶ 2]. The parties filed claim construction briefs concerning twelve disputed terms, [ECF Nos. 97, 98, 101, 102], and the Court conducted a hearing on August 6, 2020, at which the parties presented their proposed constructions, [ECF No. 110]. The Court construes the terms as set forth below.

I. LEGAL STANDARD

Claim construction is the first stage of a patent infringement analysis and requires the Court to determine “the scope and meaning of the patent claims asserted.” Clearstream Wastewater Sys., Inc. v. Hydro-Action, Inc., 206 F.3d 1440, 1444 (Fed. Cir. 2000). Claim construction is a question of law for the Court, Markman v. Westview Instruments, Inc., 517

U.S. 370, 372 (1996), to be resolved with an eye toward the fact that the Court’s adopted construction “becomes the basis of the jury instructions, should the case go to trial” on the issue of infringement, AFG Indus., Inc. v. Cardinal IG Co., 239 F.3d 1239, 1247 (Fed. Cir. 2001).

“[T]he claims of a patent define the invention to which the patentee is entitled the right to exclude.” Phillips v. AWH Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (citation and internal quotation marks omitted). “[T]he words of a claim are generally given their ordinary and customary meaning,” which “is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” Id. at 1312–13 (internal quotation marks omitted). Certain terms “may be readily apparent even to lay judges, and claim construction in such cases involves little more than the application of the widely accepted meaning of commonly understood words.” Id. at 1314. “In such circumstances, general purpose dictionaries may be helpful.” Id.

“There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” Thorner v. Sony Comput. Ent. Am. LLC, 669 F.3d 1362, 1365 (Fed. Cir. 2012). “To act as [his] own lexicographer, a patentee must clearly set forth a definition of the disputed claim term other than its plain and ordinary meaning.” Id. (citation and internal quotation marks omitted). Similarly, to establish disavowal, “[t]he patentee may demonstrate intent to deviate from the ordinary and accustomed meaning of a claim term by including in the specification expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.” Id. at 1366 (citation and internal quotation marks omitted).

“It is well-settled that, in interpreting an asserted claim, the court should look first to the intrinsic evidence of record, *i.e.*, the patent itself, including the claims, the specification and, if in evidence, the prosecution history.” Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1582 (Fed. Cir. 1996); see also Allergan Sales, LLC v. Sandoz, Inc., 935 F.3d 1370, 1373 (Fed. Cir. 2019). “First, we look to the words of the claims themselves, both asserted and nonasserted, to define the scope of the patented invention.” Vitronics, 90 F.3d at 1582. “[S]econd, it is always necessary to review the specification to determine whether the inventor has used any terms in a manner inconsistent with their ordinary meaning.” Id. “The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.” Id. For this reason, the specification “is always highly relevant to the claim construction analysis,” and “[u]sually, it is dispositive; it is the single best guide to the meaning of a disputed term.” Id. “Third, the court may also consider the prosecution history of the patent, if in evidence.” Id.

The prosecution history is relevant because

[it] was created by the patentee in attempting to explain and obtain the patent. . . . [T]he prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.

Phillips, 415 F.3d at 1317.

“In most situations, an analysis of the intrinsic evidence alone will resolve any ambiguity in a disputed claim term. In such circumstances, it is improper to rely on extrinsic evidence.” Vitronics, 90 F.3d at 1583. However, “[w]hen the intrinsic evidence is silent as to the plain meaning of a term, it is entirely appropriate for the district court to look to dictionaries or other extrinsic sources for context—to aid in arriving at the plain meaning of a claim term.” Helmsderfer v. Bobrick Washroom Equip., Inc., 527 F.3d 1379, 1382 (Fed. Cir. 2008).

“[E]xtrinsic evidence may be useful to the court, but it is unlikely to result in a reliable

interpretation of patent claim scope unless considered in the context of the intrinsic evidence.”
Phillips, 415 F.3d at 1319.

II. DISCUSSION

Each iRobot patent asserted in this litigation covers different robotic vacuum cleaner (“RVC” or “robot”) technologies or features: the ’303 patent focuses on a brush system for cleaning, the ’038 patent involves removable or modular RVC components, the ’294 patent covers the ability to map a room and resume cleaning after charging, the ’676 patent focuses on the ability to control an RVC remotely, and the ’048 patent discloses an RVC with a separate maintenance station. [ECF No. 96 at 2–3]; see generally [ECF No. 110 (materials presented at Aug. 5, 2020 Markman hearing)].

The parties present twelve disputed claim terms for construction: (1) “coulometry”; (2) “detecting a need to recharge the energy storage unit”; (3) “navigational control system configured to autonomously: control . . . return . . . dock . . . recharge . . . and then to continue . . .”; (4) “removable”; (5) “a removable caster wheel assembly disposed on the chassis, the caster wheel being configured to turn about a vertical axis and roll about a horizontal axis”; (6) “service opening in a bottom portion of the cleaning bin”; (7) “disengaged from the station housing in a vertical direction relative to the station housing”; (8) “a bagless cyclonic vacuum configured to divert debris from an incoming flow using centripetal acceleration of the debris”; (9) “prevent spooled filaments from traversing axially beyond the extremity . . .”; (10) “labyrinth seal”; (11) “transmitting a . . . report from the robotic cleaning device . . .”; and (12) “mission

status report.” [ECF No. 96 at 5–8].¹ In addition, the parties present an agreed-upon construction for one claim term: “power level.” [*Id.* at 8].

A. “Coulometry”

Patent (Claims)	iRobot’s Construction	SharkNinja’s Construction
’294 (Claim 10)	“measuring the current (flow of electric charge over time) constantly entering and leaving the power source”	“measuring the current constantly entering and leaving the power source”

Claim 10 of the ’294 patent describes an RVC “configured to determine the quantity of energy in the energy storage unit using at least one of coulometry and operating time.” [ECF No. 97-2 at 25 (20:34–36)]. The parties’ proposed constructions are similar, however, the parties disagree about iRobot’s added definition of current as the “flow of electric charge over time.” *See* [ECF No. 98 at 9]. iRobot contends that this definition is needed as the jury may confuse the terms current, voltage, and capacity. [*Id.*]. Because its proposed definition supports iRobot’s argument that coulometry measures *both* time and electric charge, its definition of current incorporates the words “over time.” [*Id.*]. SharkNinja counters this by pointing to iRobot’s own definition of coulometry in its specification, [ECF No. 101 at 6 (quoting the ’294 patent, 15:50–54)], which is nearly identical to the construction that SharkNinja proposes, [ECF No. 97 at 7]. SharkNinja also argues that “over time” is a vague term that introduces unnecessary uncertainty, [ECF No. 97 at 7], and that the words “voltage” and “capacity”—which iRobot suggests may be confusing—are not used in the claim but could be explained to a jury by an expert if necessary, [ECF No. 101 at 7].

¹ Terms are presented in the order in which they appear in the chart attached to the parties’ joint claim construction statement. [ECF No. 96 at 5–8].

It is unnecessary to look beyond the patent itself to identify an appropriate construction for this term. As SharkNinja notes, the specification for the '294 patent includes the following language: "coulometry (i.e., the measuring of current constantly entering and leaving the power source)." [ECF No. 97-2 at 23 (15:52–53)]. In a recent case cited by SharkNinja, the Federal Circuit held that "[t]he usage 'i.e.' ('*id est*' or 'that is'), 'signals an intent to define the word to which it refers.'" Tf3 Ltd. v. Tre Milano, LLC, 894 F.3d 1366, 1372 (Fed. Cir. 2018) (quoting Edwards Lifesciences LLC v. Cook Inc., 582 F.3d 1322, 1334 (Fed. Cir. 2009)). The Court agrees that the patent's specification provides a definition for coulometry that binds iRobot and should be used to construe the term for the purposes of this litigation. See Vitronics, 90 F.3d at 1582 ("The specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.").

Accordingly, the Court adopts SharkNinja's proposed construction, derived from the '294 patent's specification, and construes the term "coulometry" to mean **"measuring the current constantly entering and leaving the power source."**

B. "Detecting a need to recharge the energy storage unit"

Patent (Claims)	iRobot's Construction	SharkNinja's Construction
'294 (Claim 1)	No construction necessary. But if the Court finds that the term requires construction, then it should be construed to mean "determining a need to recharge the energy storage unit"	"determining a need to recharge based on detecting remaining battery life"

Claim 1 of the '294 patent recites "return[ing] the robot to the base charging station . . . in response to detecting a need to recharge the energy storage unit." [ECF No. 97-2 at 25 (19:37–40)]. iRobot acknowledges that "detecting a need to recharge requires some determination," but argues that Claim 1 identifies what needs to be recharged (the energy unit) without specifying how to determine that need. [ECF No. 98 at 10]. iRobot does note that

Claim 10, which is dependent on Claim 1, provides two possible methods for identifying the need to recharge: coulometry and/or operating time. [*Id.*]. SharkNinja contends that Claim 1 identifies both what needs to be recharged (the battery) and how to identify that need (detection). [ECF No. 101 at 8]. In addition, SharkNinja argues that iRobot cannot use Claim 10 and its discussion of time to expand Claim 1. [*Id.* at 8–9 (first citing 35 U.S.C. § 112(d); then citing Monsanto Co. v. Syngenta Seeds, Inc., 503 F.3d 1352, 1359 (Fed. Cir. 2007) (“[C]laims in dependent form include all the limitations of the claim incorporated by reference into the dependent claim.”))]. Instead, SharkNinja states that Claim 1’s limitations—detecting a need to recharge the battery—are binding on all dependent claims. [*Id.* at 9]. Consequently, because one embodiment cited by iRobot contemplates running according to a “predetermined time . . . without determining . . . energy level,” SharkNinja states that such an embodiment—by failing to *detect* an energy level—would be outside the scope of Claim 1. [*Id.*].

As iRobot notes, courts may not import limitations in dependent claims, such as Claim 10, into independent claims, such as Claim 1. “[I]n a situation where dependent claims have no meaningful difference other than an added limitation, the independent claim is not restricted by the added limitation in the dependent claim. In such situations, construing the independent claim to exclude material covered by the dependent claim would be inconsistent.” Trs. of Columbia Univ. v. Symantec Corp., 811 F.3d 1359, 1370 (Fed. Cir. 2016) (citations omitted). Claim 1 recites a robot that returns to the base station “in response to detecting a need to recharge the energy storage unit.” [ECF No. 97-2 at 25 (19:37–40)]. Claim 8, dependent on Claim 1, recites a robot that returns to the base station “in response to a quantity of energy remaining in the energy storage unit,” [*id.* (20:24–28)], while Claim 10 (dependent on Claim 8) recites the method for determining the quantity of energy remaining, [*id.* (20:33–36)]. Claims 8 and 10 clearly

focus on the quantity of energy in the battery, but Claim 1 merely refers to detecting a need to recharge—which may or may not be in response to the energy remaining in the battery. The Court therefore must not impose the limitations of Claims 8 and 10—which focus on the battery’s energy level—into Claim 1. See Phillips, 415 F.3d at 1315 (noting that “the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim”). Adopting SharkNinja’s proposed construction would impermissibly do so.

That being said, both parties agree that “detecting” can be read as “determining.” [ECF No. 98 at 11 (stating that “iRobot agrees that detecting a need to recharge requires some determination”); ECF No. 97 at 7–8 (“Based on detected remaining battery life, the robot determines whether it needs to recharge.”); ECF No. 96 (both proposing “determining” in place of “detecting”)]. This is also consistent with the Court’s initial findings in its Order on iRobot’s motion for preliminary injunction. [ECF No. 77 at 14 (referencing intrinsic and extrinsic evidence to identify the plain and ordinary meaning of “detect”)]; see Phillips, 415 F.3d at 1314 (stating that courts should apply “the widely accepted meaning of commonly understood words”). As the Court noted in that Order, and as iRobot does not now dispute, detection and determination both require taking some action. [ECF No. 77 at 14; ECF No. 102 at 9].²

The Court finds it unnecessary to construe the disputed claim term beyond substituting “determining” for “detecting.” The Court therefore adopts a middle ground between the parties’

² iRobot suggests that, because the parties agreed not to rely on expert testimony in connection with the Markman hearing, the parties (and by extension the Court) may not refer to expert testimony that is already in the record. [ECF No. 98 at 11 n.1]. The Court does not interpret the parties’ agreement to preclude the Court from referencing evidence either party has submitted in connection with this litigation.

proposed constructions to read “detecting a need to recharge the energy storage unit” as
“determining a need to recharge the energy storage unit.”

C. “Navigational control system configured to autonomously...”

Patent (Claims)	iRobot’s Construction	SharkNinja’s Construction
’294 (Claim 1)	No construction necessary. But if the Court finds that the term requires construction, then iRobot proposes to construe “autonomously” to mean “without human assistance or intervention.” No further construction is necessary	“a navigational control system configured to perform the claimed sequence without human assistance or intervention”

Claim 1 of the ’294 patent recites “a navigational control system configured to autonomously: control . . . return . . . dock . . . recharge . . . and then to . . . direct the robot to continue to clean the room.” [ECF No. 97-2 at 25 (19:32–45)]. Both parties agree that “autonomously” can be defined as “without human assistance or intervention,” although iRobot suggests it is unnecessary to engage in claim construction. [ECF No. 97 at 9; ECF No. 98 at 11].

Where the parties differ is whether to construe the claim’s list of actions (control, return, dock, recharge, continue) as “a claimed sequence.” SharkNinja advocates for this construction, [ECF No. 97 at 9], while iRobot believes, again, that no construction is necessary, [ECF No. 98 at 12]. SharkNinja argues that the claimed language presents an order of operations, and that Federal Circuit precedent holds that language presented in such a way requires steps to be performed in a certain order. [ECF No. 97 at 9 (citing Mformation Techs., Inc. v. Rsch. in Motion Ltd., 764 F.3d 1392, 1398 (Fed. Cir. 2014)]. iRobot contends that Claim 1 is an “apparatus” claim (covering what the device is) and not a “method” claim (covering what the device does), therefore determining an order or sequence of steps is inappropriate. [ECF No. 98

at 12]. In support, iRobot points to the language “configured to,” which courts have found to refer to apparatus claims. [*Id.*].

“[A] claim ‘requires an ordering of steps when the claim language, as a matter of logic or grammar, requires that the steps be performed in the order written, or the specification directly or implicitly requires’ an order of steps.” *Mformation Techs.*, 764 F.3d at 1398–99 (quoting *TALtech Ltd. v. Esquel Apparel, Inc.*, 279 F. App’x 974, 978 (Fed. Cir. 2008)). Although *Mformation* involved a method claim, the Federal Circuit and “several district courts have . . . concluded that order can be required by a system/apparatus claim.” *Avago Techs. Gen. IP (Singapore) PTE Ltd. v. Asustek Comput., Inc.*, No. 15-cv-04525, 2016 U.S. Dist. LEXIS 70243, at *36 (N.D. Cal. May 27, 2016) (citing *Oak Tech., Inc. v. ITC*, 248 F.3d 1316, 1328 (Fed. Cir. 2001) and collecting cases); *see also Uniloc 2017 LLC v. Google LLC*, No. 18-cv-00496, 2020 U.S. Dist. LEXIS 9405, at *99–102 (E.D. Tex. Jan. 20, 2020) (citing *Mformation* and *Avago* and finding that steps outlined in an apparatus claim required steps to be taken in a certain order).

Based on the Federal Circuit’s opinion in *Mformation* and case law interpreting that opinion in the context of apparatus claims, the Court concludes that SharkNinja’s interpretation is correct. The steps outlined in Claim 1 must be completed in a certain order: the vacuum cannot return (step 2) unless it has already moved around the room (step 1); it cannot dock (step 3) unless it has returned (step 2) from moving around the room (step 1). *See* [ECF No. 97-2 at 25 (19:32–45)]. Further, the final step is prefaced with “and then,” suggesting that all previous steps have been completed before the final step may proceed. *See [id.]*. This is consistent with the Federal Circuit’s holding in *Mformation*. 764 F.3d at 1399–1400 (“[W]e note that other sub-steps in claim 1 inherently require an order-of-steps.”); *see Oak Tech.*, 248 F.3d at 1328 (“As our sequential view of the claim language would indicate, . . . the device claimed in the

'715 patent first performs error correction on an entire Sector of data, and *then* performs error detection with a cyclic redundancy checker on the entire corrected Sector of data.”). As SharkNinja conceded during the Markman hearing, however, cleaning and mapping could occur simultaneously with certain steps: for example, cleaning and mapping could occur while returning to the base station. See [ECF No. 110].³

The Court therefore adopts SharkNinja’s proposed construction and construes “a navigational control system configured to autonomously: control . . . return . . . dock . . . recharge . . . and then to continue” as “**a navigational control system configured to perform the claimed sequence without human assistance or intervention.**”

D. “Removable”

Patent (Claims)	iRobot’s Construction	SharkNinja’s Construction
'038 Patent (Claims 1, 9, 10)	No construction necessary	“capable of being detached and reattached”
'303 Patent (Claims 1, 10)		

Both the '038 and '303 patents refer to parts of the robot—a caster wheel assembly, a cover, a bumper, and an end guard—that are “removable.” [ECF No. 97-3 at 48 (14:40); *id.* at 49 (15:21–24); ECF No. 97-4 at 50 (17:44–45, 18:34)]. SharkNinja states that the focus of the '038 patent is the ability to remove a part for repair or replacement, and that the intent is to be

³ During the Markman hearing, iRobot asked the Court to look to the patent’s specification and embodiments in support of its position, however the Court focuses its attention on the limitations set forth in the claim itself. See Oak Tech., 248 F.3d at 1328–29 (stating that “[t]he sequential limitation is imposed by the claim language itself” and referring to the specification only insofar as they confirm the limitations set forth in the claim); Tex. Instruments, Inc. v. U. S. ITC, 988 F.2d 1165, 1171 (Fed. Cir. 1993) (“[T]o construe the claims in the manner suggested by [plaintiff] would read an express limitation out of the claims. This, we will not do because ‘courts can neither broaden nor narrow claims to give the patentee something different than what he has set forth.’” (quoting Autogiro Co. of Am. v. United States, 384 F.2d 391, 396 (Ct. Cl. 1967))).

able to remove a part without damaging the robot. [ECF No. 97 at 11–12; ECF No. 101 at 12]. SharkNinja further argues that something removable is capable of being reattached, otherwise something that could be broken off the vacuum could be considered “removable.” [ECF No. 101 at 12–13; ECF No. 97 at 11–12]. iRobot’s position is that the plain meaning of the word “removable” is obvious and requires no construction. [ECF No. 98 at 6]. Further, iRobot argues that SharkNinja’s construction would mean that a removable part would have to be able to be attached again even though, as iRobot argues, being removable does not necessarily mean a part can be reattached. [*Id.*]. Instead, iRobot notes that something removable may simply be replaceable, and that even if a part *could* be reattached, the specification does not *require* removable parts to have that capability. [*Id.* at 7].

The ’038 patent is directed at eliminating the need to “send the whole robot to a repair service for servicing,” [ECF No. 97-3 at 42 (1:33–34)], by providing for modular parts that can be removed, repaired, and replaced, [*id.* at 44 (5:35–42)]. As iRobot explained during the Markman hearing, removability is “central” to the patent. *See* [ECF No. 110]. The specification for the ’038 patent notes that certain “modules can be removed from a coverage robot and replaced *without affecting the functionality of the robot . . .*” [ECF No. 97-3 at 42 (1:52–55) (emphasis added)]. Similarly, the ’303 patent provides that “[t]he end guards 130 may be removable, in order to facilitate installation and/or removal of the spool roller 100 from a robot cleaner 10.” [ECF No. 97-4 at 44 (5:52–54)]; *see also* [*id.* (5:67–6:1) (stating that “[t]he end guard 130 is removable for brush cleaning”)]. These examples suggest that the parts are designed to be removed without damaging the robot. *See Fargo Elecs., Inc. v. Iris Ltd., Inc.*, No. 04-cv-01017, 2005 U.S. Dist. LEXIS 34493, at *36 (D. Minn. Nov. 30, 2005) (“Because the use of this term throughout the patent indicates that the structure in which the pins are mounted is

still usable after the pins are removed, it is clear in the context that *to be removable within the meaning of the claims*, the act of removing must not cause any damage to that structure.”

(emphasis added)). The fact that a certain part can be removed and later reattached, however, suggests that a construction requiring reattachment would not appropriately account for occasions when a part is replaced with a new part (i.e., the original part is not reattached).

Beyond this intrinsic evidence, the term “removable” would ordinarily fall into that class of terms whose meaning “may be readily apparent even to lay judges,” such that claim construction could “involve[] little more than the application of the widely accepted meaning of commonly understood words.” Phillips, 415 F.3d at 1314. The plain meaning of “removable” is the ability to be taken off or away (eliminated, transferred) without necessarily communicating a corresponding ability to reattach. While something removable may be capable of reattachment, the plain meaning of this term is simply “able to be removed,” which neither requires nor negates the possibility of reattachment.

Although the Court could choose not to construe this term, given SharkNinja’s contentions about damage and iRobot’s seeming resistance to such a limitation, some construction is necessary to ensure that the term is in keeping with the patents’ specification. See O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co., 521 F.3d 1351, 1361 (Fed. Cir. 2008) (“In this case, the ‘ordinary’ meaning of a term does not resolve the parties’ dispute, and claim construction requires the court to determine what claim scope is appropriate in the context of the patents-in-suit.”).

During the Markman hearing, the Court proposed the following construction: “capable of being detached without damage to the part or whole.” See [ECF No. 110]. The parties conceded that this was workable, though SharkNinja preferred a construction that included a possibility of

reattachment, while iRobot felt that there could be categories of damage that might be acceptable. Taking into consideration the plain meaning of the term, the parties' contentions, and the intrinsic evidence from both patents, the Court construes "removable" to mean **"capable of being detached without damage to the part or whole."**

E. "A removable caster wheel assembly disposed on the chassis"

Patent (Claims)	iRobot's Construction	SharkNinja's Construction
'038 (Claim 1)	The term "caster wheel assembly" means "support wheel assembly other than a drive wheel." No further construction is necessary	"a caster wheel assembly disposed on the chassis allowing the caster wheel to turn about a vertical axis and roll about a horizontal axis, wherein the complete caster wheel assembly can be detached and reattached without taking it apart"

Claim 1 of the '038 patent references a "removable caster wheel assembly" with "the caster wheel being configured to turn about a vertical axis and roll about a horizontal axis" [ECF No. 97-3 at 48 (14:40–42)]. Further, Claim 1 states that "the drive wheel assemblies and the removable caster wheel assembly are separately and independently removable from respective receptacles of the chassis as complete units." [*Id.* (14:56–59)]. iRobot claims that its proposed construction clarifies that the drive wheel and caster wheel assemblies are distinct. [ECF No. 98 at 7]. iRobot goes on to argue that a "caster wheel assembly" can simply be a caster wheel, [*id.* at 8], and an assembly need not include a "housing" as depicted in Figure 8 of the patent, [*id.* at 8–9]. In support, iRobot points out that Claim 1 references a housing for the "drive wheel assembly" and the "cleaning assembly" but not a "caster wheel assembly." [ECF No. 102 at 7]. SharkNinja contends that iRobot's construction effectively eliminates the word "assembly" from the claim in an attempt to broaden it. [ECF No. 101 at 13]. SharkNinja notes that "assembly" implies more than one component, such as a wheel plus a housing, and does not

mean a caster wheel alone. [*Id.*]. Lastly, SharkNinja takes issue with iRobot’s attempt to distinguish the caster wheel assembly from the drive wheel assembly. [ECF No. 97 at 14].

It is clear from the claim that a “caster wheel assembly” contemplates something more than just a caster wheel. First, the claim refers to a “caster wheel assembly” as distinct from a “caster wheel”: “a removable caster wheel assembly . . . the caster wheel being configured to . . .” [ECF No. 97-3 at 48 (14:40–41)]. In one example provided in the specification, the caster wheel assembly is described as being “separately and independently removable from the chassis and the coverage robot” and “includ[ing] a caster wheel housing 802, a caster wheel 804, a wheel-drop sensor 806, and a wheel-floor proximity sensor 808.” [*Id.* at 46 (10:47–52) (describing Fig. 8)]. This description distinguishes between a caster wheel assembly (“114”) and a caster wheel (“804”). The Court takes iRobot’s point that Figure 9B does not depict a housing, yet Figure 9B does depict more than just a caster wheel. [*Id.* at 33 (depicting a caster wheel assembly (“114”) as containing a caster wheel (“804”), an infrared emitter (“902”), and a post)]. Claim 1 and the specification thus repeatedly refer to a caster wheel assembly as something more than just a caster wheel.

Further, as SharkNinja notes, a caster wheel is only able to move horizontally when combined with something else, like a post, therefore Claim 1 clearly contemplates that the “caster wheel assembly” is more than just a caster wheel. In addition, Claim 1 refers to the caster wheel assembly as a “complete unit[,]” which further erodes iRobot’s position that an assembly could refer to a caster wheel alone rather than as part of a unit. *See* [*id.* at 48 (14:59)]; SimpleAir, Inc. v. Sony Ericsson Mobile Commc’ns. AB, 820 F.3d 419, 429 (Fed. Cir. 2016) (“[I]nterpretations that render some portion of the claim language superfluous are disfavored.” (quoting Power Mosfet Techs., L.L.C. v. Siemens AG, 378 F.3d 1396, 1410 (Fed. Cir. 2004))).

As to the distinction between a caster wheel and a drive wheel, Claim 1 and the specification repeatedly distinguish between these two types of wheels. See [ECF No. 97-3 at 48 (14:40–43) (“a removable caster wheel assembly . . . multiple drive wheel assemblies”); id. at 44 (6:59–61) (“The chassis 202 carries . . . the drive wheel assemblies 110a-b, and the caster wheel assembly 114 . . .”]. Claim 1 states that a drive wheel assembly requires a drive motor to propel the wheel. [Id. at 48 (14:43–48) (“multiple drive wheel assemblies . . . each drive wheel assembly comprising . . . a wheel drive motor”)]. In contrast, Claim 1’s description of a caster wheel assembly does not reference a motor, providing support for the interpretation that the only type of wheel a caster wheel assembly can contain is a caster wheel. [Id. (14:40–42)].

Accordingly, the Court adopts aspects of each party’s proposed construction—and incorporates its construction of “removable,” supra, Section I.D—so that “a removable caster wheel assembly disposed on the chassis” shall mean **“a support wheel assembly disposed on the chassis allowing the caster wheel to turn about a vertical axis and roll about a horizontal axis, wherein the complete caster wheel assembly can be detached without damage to the assembly or the robot.”**

F. “Service opening in a bottom portion of the cleaning bin”

Patent (Claims)	iRobot’s Construction	SharkNinja’s Construction
’048 (Claim 12)	No construction necessary. But if the Court finds that the term requires construction, then it should be construed to mean “service opening in a bottom part or section of the cleaning bin”	“service opening on the bottom surface of the cleaning bin”

Claim 12 of the ’048 patent recites “a robot comprising . . . a cleaning bin,” with “the cleaning bin defining a service opening in a bottom portion of the cleaning bin for removing debris” [ECF No. 97-6 at 45 (16:7–16, 17–19)]. Throughout the specification, a “service

opening” is alternately referred to as an “evacuation port,” and a “cleaning bin” is alternately referred to as a “robot bin.” These features are located on the robot itself, while other features described in the patent are located on a separate “maintenance station.”

In support of its proposed construction, SharkNinja relies on the specification and prosecution history, which distinguish between bottom and rear, to argue that “bottom portion” should be read as “bottom surface,” and notes that iRobot used “bottom portion” due to prior art. [ECF No. 97 at 15–16]. SharkNinja also argues that during the prosecution of an ancestor patent, iRobot stated that the distinction between top, bottom, and side is “not [] trivial,” although it is now trying to minimize the distinction. [*Id.* at 16]. iRobot maintains that “portion” means part of a whole and is not limited to a specific surface, and points to instances where the patent describes the “underside” or “lower surface” of the robot as examples of a specific intent to refer to a bottom surface as opposed to a bottom portion. [ECF No. 98 at 21, 22]. As to the prosecution history, iRobot claims that it did not clearly disavow the side of a robot from the scope of the “bottom portion” of the robot. [*Id.*].

Claims 8 and 12 both use the word “portion” to refer to part of the robot or part of the maintenance station. [ECF No. 97-6 at 45 (15:54–56) (referring to station cover on top portion of maintenance station’s housing); *id.* (16:17–18) (referring to bottom portion of cleaning bin on a robot); *id.* (16:25–26) (referring to collection bin attached to top portion of maintenance station)]. “Bottom portion” does not appear in the specification. “Top portion” appears twice in the specification: once with regard to the maintenance station, when describing a figure that depicts a feature extending from the top surface down to the side of the maintenance station, [*id.* at 40 (6:20–22)]; and once with regard to the robot itself, in the context of describing Figures

12A and 12B, both of which show an evacuation port on the top surface of the robot, [*id.* at 41 (8:59–65)].

Throughout the specification, references to the “bottom” of the robot mean “bottom surface.” *See Vitronics*, 90 F.3d at 1582 (“The specification acts as a dictionary when it expressly defines terms used in the claims *or when it defines terms by implication.*” (emphasis added)); *see, e.g.*, [ECF No. 97-6 at 41 (7:25–31) (referencing Fig. 7 and a catch installed on what is described as both the “bottom side” and “bottom” of the robot that, per the figure and description, could refer only to the bottom surface); *id.* (7:35–36) (discussing “brushes . . . at the bottom of the robot,” where brushes only ever appear on the bottom surface of the robot throughout the patent); *id.* at 42 (9:50–51) (describing Fig. 13B, which shows an evacuation port on the bottom surface, as allowing for debris to be “evacuated down out of the bottom of the robot”); *id.* (9:55) (describing Fig. 14C, which shows an evacuation port on the bottom surface, as allowing for debris to be “evacuated down out of the bottom of the robot”); *id.* (9:59) (describing Fig. 15B, which shows an evacuation port on the bottom surface, as allowing for debris to be “evacuated down out of the bottom of the robot”); *id.* (9:63–64) (describing Fig. 16B, which shows an evacuation port on the bottom surface, as allowing for debris to be “evacuated down out of the bottom of the robot”)].

Other parts of the specification distinguish the top from the edge/side and bottom in such a way that it is clear that the bottom being described is the robot’s bottom surface. *See, e.g.*, [ECF No. 97-6 at 41 (8:8–11) (describing multiple possible locations for a robot’s evacuation port including “an edge,” “a top most portion,” and “the bottom of the chassis”); *id.* (8:22–24) (describing multiple possible locations for a robot’s evacuation port as being on “a top or bottom

side”);⁴ id. at 42 (10:12) (describing actions the maintenance station may take in servicing the robot “from the top, bottom, or sides of the robot”)]. Still other parts of the specification refer to the rear of the robot, rather than the “bottom portion,” meaning the rear or side of the robot only. See, e.g., id. at 42 (10:1–2) (describing Fig. 17C, which shows an evacuation port on the rear or side surface of the robot, as being used to “evacuate debris out of the rear of the robot bin”)].

There is only one instance in the specification when “top portion” means something other than top surface, and that is in reference to the maintenance station, not the robot. [ECF No. 97-6 at 40 (6:20–22)]. The specification therefore provides support for SharkNinja’s proposed construction of “bottom portion” to mean the “bottom surface” of the robot.⁵ “Usually, [the specification] is dispositive; it is the single best guide to the meaning of a disputed term.” Vitronics, 90 F.3d at 1582; see In re Abbott Diabetes Care, Inc., 696 F.3d 1142, 1150 (Fed. Cir. 2012) (“We have held that . . . ‘the specification may define claim terms by implication such that the meaning may be found in or ascertained by a reading of the patent documents.’” (quoting Irdeeto Access, Inc. v. Echostar Satellite Corp., 383 F.3d 1295, 1300 (Fed. Cir. 2004))).

Prosecution history is also relevant in determining whether an inventor limited the scope of a claim. Phillips, 415 F.3d at 1317. “As long as the same claim limitation is at issue,

⁴ A later reference to Figures 11A–11B discusses an evacuation port on the “top side,” where Figure 11B shows the port on the top surface of the robot. [ECF No. 97-6 at 41 (8:52–54)]. This, in addition to other references to “bottom side,” id. at 41 (7:25–31)], support reading references to “bottom side” and “top side” as bottom surface and top surface.

⁵ iRobot cites to a 2011 case from the Southern District of Texas, Wright Asphalt Prods. Co., LLC v. Pelican Ref. Co., LLC, in support of its interpretation of bottom portion as referring to the bottom section or part of the vacuum. No. 09-cv-01145, 2011 U.S. Dist. LEXIS 22309, at *63 (S.D. Tex. Mar. 7, 2011). In that case, the judge found that—based on intrinsic and extrinsic evidence, including expert testimony—“a bottom portion” referred to the “an area below a middle portion” of the invention at issue. See id. at *73. In contrast, the intrinsic evidence in this case supports Shark’s proposed construction.

prosecution disclaimer made on the same limitation in an ancestor application will attach.”

Omega Eng’g, Inc. v. Raytek Corp., 334 F.3d 1314, 1333 (Fed. Cir. 2003). iRobot argues that some of the statements SharkNinja uses from the patent’s prosecution history were later withdrawn and so cannot be used here. [ECF No. 102 at 24]. SharkNinja counters this by citing case law to support the opposite conclusion: that whether or not an examiner relied on statements, the statements are relevant to claim interpretation. [ECF No. 101 at 18 (citing Microsoft Corp. v. Multi-Tech Sys., 357 F.3d 1340, 1350 (Fed. Cir. 2004))]. In Microsoft, the Federal Circuit allowed a party to rely on statements the patentee made as to claims in one patent to support claim construction on a later patent, noting that “a patentee’s statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation.” 357 F.3d at 1350. Both the parent and grandparent applications for the ’048 patent included a similar claim to Claim 12. [ECF No. 97-8 at 4–5 (parent application’s Claim 7, describing a robot with a “cleaning bin defining a service opening in a . . . bottom portion of the cleaning bin for removing debris”)]; [ECF No. 97-9 at 4–5 (grandparent application’s Claim 7, describing a robot with a “cleaning bin carried by the chassis, toward the back end of the chassis”)].

In the grandfather application, a distinction was made between placing an evacuation port on the “back end” of the robot, which differentiated the claimed invention from a competitor’s prior art (Arai), that “described removing debris from a dust ejection port 60 on the bottom of the dust collection case” or “on the top of a dust collection case.” [ECF No. 97-9 at 12]. The grandfather application instead claimed an evacuation port on the “back end” of the robot, noting that “[t]his is not a trivial distinction” because it would “allow[] the area along the bottom portion of the chassis to be used to carry sensors, wheels, and a cleaning head.” [Id. at 12–13].

Thus, the back end of the robot was distinguished from the “bottom portion,” clearly referring to the bottom surface, where the robot’s wheels and cleaning head are located.

The parent application also equated “bottom portion” with “bottom surface.” In that application, a distinction was made between the claimed robot and another competitor’s prior art (Reed), which “requires the debris outlet to be on a top surface of the mobile unit, and not a bottom surface” [ECF No. 97-8 at 12]. The application claimed that this distinction “does not teach or render obvious at least the underlined features of claim[] . . . 7,” which includes Claim 7’s reference to a “bottom portion.” [*Id.* at 13; *id.* at 5]. The parent application therefore equated bottom portion with bottom surface.

Although iRobot contends that some of these statements were not material, were later withdrawn, or were not relied on by the patent examiner, “a patentee’s statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation.” Microsoft, 357 F.3d at 1350. Unlike the cases cited by iRobot, see [ECF No. 98 at 24], the issue here is not whether SharkNinja relied on withdrawn statements, but whether the statements evince the inventor’s intended meaning of the terms at issue.

[A]rguments made during the prosecution history are relevant in determining the meaning of the terms at issue. Those arguments, and other aspects of the prosecution history, as well as the specification and other claims, must be examined to ascertain the true meaning of what the inventor intended to convey in the claims.

E.I. Du Pont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1438 (Fed. Cir. 1988).

Having reviewed the patent’s claims, specification, and prosecution history, the Court finds that the inventor intended “bottom portion” in Claim 12 to mean “bottom surface.”

As with the term “removable,” here “the ‘ordinary’ meaning of a term does not resolve the parties’ dispute, and claim construction requires the court to determine what claim scope is appropriate in the context of the patents-in-suit.” O2 Micro, 521 F.3d at 1361. The Court

therefore adopts SharkNinja’s proposed construction and construes “service opening in a bottom portion of the cleaning bin” to mean “**service opening on the bottom surface of the cleaning bin.**”

G. “Disengaged from the station housing in a vertical direction...”

Patent (Claims)	iRobot’s Construction	SharkNinja’s Construction
'048 (Claim 12)	No construction necessary. But if the Court finds that the term requires construction, then iRobot proposes to construe “disengaged” to mean “removed or separated.” No further construction is necessary	“vertically released from an engaged position with the station housing”

Claim 12 of the '048 patent describes an RVC with “a collection bin removably attached to a top portion of the station housing, the collection bin being in pneumatic communication with the evacuation passageway and configured to be disengaged from the station housing in a vertical direction relative to the station housing” [ECF No. 97-6 at 45 (16:24–29)].

SharkNinja argues that “disengaged” refers to something more than mere “removal,” and notes that the patent consistently refers to disengaging or engaging as unlocking or locking, not just removing. [ECF No. 97 at 18].⁶ iRobot contends that disengaging the bin does not involve a release mechanism but is simply a reference to removing the bin. [ECF No. 98 at 19]. iRobot also notes that the patent does not set forth “grooves” for locking and unlocking the bin, observing that these are depicted in a figure but are not a required or explicit feature of the RVC. [ECF No. 102 at 21].

⁶ Although the parties briefed the meaning of “vertical direction,” during the Markman hearing SharkNinja clarified that the parties’ dispute did not require the Court to construe “vertical direction” but was instead limited to whether the action of disengaging involves removal, as iRobot would have it, or release. See [ECF No. 110]. The Court will therefore not address the parties’ arguments regarding the phrase “vertical direction.”

Although the term “disengaged” “is used in common parlance and has no special meaning in the art,” Summit 6, LLC v. Samsung Elecs. Co., 802 F.3d 1283, 1291 (Fed. Cir. 2015), some construction is required. This is because “[a] determination that a claim term ‘needs no construction’ or has the ‘plain and ordinary meaning’ may be inadequate when a term has more than one ‘ordinary’ meaning or when reliance on a term’s ‘ordinary’ meaning does not resolve the parties’ dispute.” O2 Micro, 521 F.3d at 1361.

Claim 12’s description of the collection bin provides that the bin is in “pneumatic communication with the evacuation passageway,” such that it must be “disengaged” from the station housing in a certain manner. [ECF No. 97-6 at 45 (16:25–29)]. This alone suggests that something more than mere removal must take place in order to break the “communication” between the parts described. Further, the claim language includes “removably,” indicating that the inventor chose not to use “removed” to describe how the collection bin is separated from the maintenance station. For example, the specification includes a sentence that describes a “*removable* cleaning head cartridge” that “is *removed* from the robot”—without switching to use the word “disengaged” to describe how the item is removable. [Id. at 42 (10:55–57) (emphasis added)].

The specification uses the word “disengage” only a handful of times. Several instances are identical to the term’s use in Claim 12 and are therefore not helpful in further distinguishing the term. See [ECF No. 97-6 at 40 (6:18–27)]. The specification describes Figures 10A and 10B as showing that the evacuation assembly on the maintenance station “disengages the port cover on the robot cleaning bin.” [Id. at 41 (8:37–38)]. The Figures themselves show that the port cover is being lifted on what appears to be a hinge but is not removed or separated from the robot, unlike the removable collection bin in Claim 12. [Id. at 22]. As for the specification’s use

of the word “remove,” or “removable,” in one description the specification states that “the collection bin may be removable from the maintenance station,” [*id.* at 38 (2:48–49)], but does not describe how this removal must occur, for example, whether it occurs through some mechanical lock and release, or by being “disengaged” as described elsewhere in the specification and in Claim 12. This is consistent with other uses of the words “remove” and “removable” throughout the specification.

The Court may look to extrinsic evidence, such as dictionaries, to assist in interpreting the word “disengage.” “Dictionaries or comparable sources are often useful to assist in understanding the commonly understood meaning of words and have been used both by [the Federal Circuit] and the Supreme Court in claim interpretation.” *Phillips*, 415 F.3d at 1322. “Judges . . . may . . . rely on dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict any definition found in or ascertained by a reading of the patent documents.” *Vitronics*, 90 F.3d at 1584 n.6. The Court must therefore consider dictionary definitions of “disengage” in the context of the claims and specification.

Both parties provide several dictionary definitions of the word. Definitions provided by SharkNinja include “to release from something that engages” or “to release or detach.” [ECF No. 97-11 at 4 (providing definitions from Webster’s New Collegiate Dictionary (1977)); ECF No. 97-12 at 2 (providing definitions from Merriam-Webster’s Collegiate Dictionary Online)]. iRobot provides one definition, “to break the contact between two objects.” [ECF No. 98-12 at 5 (providing definition from McGraw-Hill’s Dictionary of Engineering (2d ed. 2003))]. These definitions are consistent with Claim 12 and the specification’s use of “disengaged” as meaning something distinct from removal.

Although the Court agrees with iRobot that Claim 12 and the specification do not require a locking mechanism to secure the collection bin to the maintenance station, the patent's use of the term "disengaged" suggests something more than mere removal is being described. This is consistent with the extrinsic evidence reviewed. See Phillips, 415 F.3d at 1319 ("[E]xtrinsic evidence . . . is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence."). The Court therefore construes "disengaged from the station housing in a vertical direction" as **"released from the station housing in a vertical direction."**

H. "A bagless cyclonic vacuum configured to divert debris from an incoming flow using centripetal acceleration of the debris"

Patent (Claims)	iRobot's Construction	SharkNinja's Construction
'048 (Claim 12)	No construction necessary. But if the Court finds that the term requires construction, then it should be construed to mean "bagless vacuum that uses a cyclonic airflow to separate at least some debris"	The term "bagless cyclonic vacuum" means "bagless vacuum structured to create cyclonic airflow to separate debris." No further construction is necessary

Claim 12 of the '048 patent describes a maintenance station with an "air mover" that "comprises a bagless cyclonic vacuum configured to divert debris from an incoming flow using centripetal acceleration of the debris." [ECF No. 97-6 at 45 (16:31–36)]. SharkNinja contends that iRobot's proposed construction would broaden the claim to apply to any product that might happen to create a cyclonic airflow without being designed to do so. [ECF No. 97 at 19]. Similarly, SharkNinja points to iRobot's proposed use of the phrase "at least some" to modify "debris" as a means of broadening the claim. [*Id.*]. iRobot argues that SharkNinja's proposed construction would be repetitive as it defines "a bagless cyclonic vacuum" by repeating language that follows this phrase in the claim. [ECF No. 98 at 18]. iRobot also notes that a proposed claim construction that simply repeats or paraphrases the claim is not "construction" and is not

helpful to a jury. [*Id.* (citing *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 863 (Fed. Cir. 2004))]. In addition, iRobot argues that allowing SharkNinja to interpret the claim term so as to exclude vacuums that inadvertently create a cyclonic airflow would impermissibly read a subjective element into the claim. [ECF No. 102 at 20].

“Configured to” suggests something that was purposefully designed to do something, rather than something that happens to be able to do something. Consistent with this interpretation, the Federal Circuit has held that phrases like “configured to” or “adapted to” typically do not mean “capable of.” See *Aspex Eyewear, Inc. v. Marchon Eyewear, Inc.*, 672 F.3d 1335, 1349 (Fed. Cir. 2012) (noting that, in light of the claim, a narrower meaning of “adapted to” to mean “configured to,” rather than “capable of” was appropriate); *In re Giannelli*, 739 F.3d 1375, 1379 (Fed. Cir. 2014) (“Although the phrase can also mean ‘capable of’ or ‘suitable for,’ here the written description makes clear that ‘adapted to,’ as used in the [patent] application, has a narrower meaning” (internal citation and quotation marks omitted)). In the context of Claim 12, it is clear that “configured to” is used consistently to mean that the features described “are designed or configured to accomplish the specified objective, not simply that they can be made to serve that purpose.” *Aspex Eyewear*, 672 F.3d at 1349; see, e.g., [ECF No. 97-6 at 45 (16:9–11) (Claim 12, describing “a drive system . . . configured to maneuver the robot as directed by a controller in communication with the drive system”); *id.* (16:16–17) (Claim 12, describing “a cleaning bin . . . configured to receive debris agitated by the cleaning assembly”)]. iRobot’s proposed construction, in combination with its attempt to add “at least some” to the claim, is thus an impermissible attempt to broaden the claim.

Accordingly, the Court adopts SharkNinja’s proposed construction and construes “a bagless cyclonic vacuum configured to divert debris from an incoming flow using centripetal

acceleration of the debris” to mean “**a bagless vacuum structured to create cyclonic airflow to separate debris.**”

I. “Prevent spooled filaments from traversing axially beyond the extremity . . .”

Patent (Claims)	iRobot’s Construction	SharkNinja’s Construction
'303 (Claims 1, 10)	No construction necessary. But, if the Court finds that the term requires construction, then iRobot proposes to construe “traversing axially beyond the extremity” to mean “going beyond the end.” No further construction is necessary	“keep spooled filaments within the brush ends”

Claims 1 and 10 of the '303 patent recite an “axial end guard configured to prevent spooled filaments from traversing axially beyond the extremity of” the mounting feature (Claim 1) or at least one of the mounting features (Claim 10). [ECF No. 97-4 at 50 (17:41–43, 18:31–34)]. In short, these end guards are designed to keep hair from traveling past the brushes and getting caught in the bearings or other features that are located beyond the mounting features. [ECF No. 97 at 20; ECF No. 98 at 13]. SharkNinja argues that the language in the claim is unclear and that its proffered alternative is a “simple and accurate way” to describe the claimed function. [ECF No. 97 at 21]. iRobot responds that the phrase “brush ends” does not appear anywhere in the two claims and is not equivalent to a “mounting feature.” [ECF No. 98 at 13–14].

As iRobot notes, the patent’s specification provides several examples of what some embodiments of the end guards may do, [ECF No. 102 at 13], including “limit the longitudinal travel of filaments 33, keep filaments 33 and collected hair 33 within the brush ends 135A-B, *and/or* prevent hair 33 from spilling over onto bearings 143 that may be 20 located at either one or both longitudinal ends of the roller 100.” [ECF No. 97-4 at 44 (5:17–22) (emphasis added)]. The claims describe “mounting features,” and SharkNinja does not contend that “brush ends” are

a type of mounting feature. In addition, the specification suggests that keeping hair within the brush ends is only one of several possible functions of the end guards, so that limiting the claims as suggested by SharkNinja would be inappropriate.

Because the language in the claims is dense and the parties disagree about its meaning, the Court finds that some interpretation would be helpful to a jury. See O2 Micro, 521 F.3d at 1362 (“When the parties present a fundamental dispute regarding the scope of a claim term, it is the court’s duty to resolve it.”). The Court therefore adopts iRobot’s construction and construes “prevent spooled filaments from traversing axially beyond the extremity . . .” to mean **“prevent spooled filaments from going beyond the end . . .”**

J. “Labyrinth seal”

Patent (Claims)	iRobot’s Construction	SharkNinja’s Construction
’303 (Claim 9)	No construction necessary	“a seal formed in a maze-like pattern”

Claim 9 of the ’303 patent recites a robot “wherein the axial end guard forms a labyrinth seal about the end mounting feature on which the axial end guard is mounted.” [ECF No. 97-4 at 50 (18:13–15)]. SharkNinja states that “labyrinth seal” is a term of art that should be defined for the jury and cites to several dictionary definitions that support its proposed construction of “maze-like.” [ECF No. 97 at 21–22]. iRobot is concerned that SharkNinja’s construction is too narrow as several sources define labyrinth seals that are not maze-like. [ECF No. 98 at 14].

The claim itself does not provide insight into what the term encompasses. The specification names a labyrinth seal only once, in reference to Figure 6. In discussing the figure, the specification states that a “‘fender’ or labyrinth wall . . . is a perimeter wall” that “forms a *simple labyrinth seal* that further prevents accumulations of hair and other filaments 33 from passing the end guard 130 to enter the area where the bearing/bushing 143 is mounted.” [ECF

No. 97-4 at 44 (6:53–59) (emphasis added)]. The words “simple,” “fender,” and “perimeter wall” suggest that the labyrinth seal contemplated by the specification is not particularly complex. As the Court may not read limitations into a claim from a figure or the specification, Phillips, 415 F.3d at 1320, and given the specification’s limited description of labyrinth seals, the Court will also review extrinsic evidence.

The parties provide extrinsic evidence from several sources in support of their proposed constructions. SharkNinja cites to the Seals and Sealing Handbook, which describes a “simple labyrinth” as a “bearing seal . . . designed to provide a torturous path into the bearing,” and states that “[t]he complexity will depend on the application and also bearing design.” [ECF No. 97-16 at 14 (Robert Flitney, Seals and Sealing Handbook 138 (5th ed. 2007))]. Similarly, the Handbook later describes a “labyrinth seal” as “providing a contorted path.” [*Id.* at 17]. Another source describes labyrinth seals as “maze-like” with “many turns.” [ECF No. 97-17 at 2 (“GMN Bearing USA, The History & Design of the Labyrinth Seal (2020))]. SharkNinja also references a resource that links labyrinth seals to a “maze (labyrinth) of turns and angles” designed to protect the bearing. [ECF No. 97-18 at 4 (Wes Cash, How Labyrinth Seals Control Contaminant Ingression, <https://www.machinerylubrication.com/Articles/Print/29452> (last visited Jan. 12, 2021))].

One source provided by iRobot describes a labyrinth seal as possessing “structural simplicity” and “consist[ing] of a series of cavities connected by small clearances,” but does not use the word maze to describe these seals. [ECF No. 98-13 at 2 (Tong Seop Kim and Kyu Sang Cha, Comparative Analysis of the Influence of Labyrinth Seal Configuration on Leakage Behavior, 23 J. Mech. Sci. and Tech. 2830, 2830 (2009))]. A second source provided by iRobot recites a variety of types of labyrinth seals, including “straight, stepped, and mixed straight and

stepped seal configurations,” but does not describe them as maze-like. [ECF No. 98-14 at 19 (Air Force Wright Aeronautical Laboratories, Labyrinth Seal Analysis: Volume III at 2 (Jan. 1986))].⁷

The specification, describing “a simple labyrinth seal,” read in combination with the claim itself and extrinsic evidence provided by the parties, suggests that SharkNinja’s proposed construction may lead the jury to understand the term as describing only a particularly complex seal, thereby impermissibly narrowing the term. While a complicated, maze-like structure might be one way to create a labyrinth seal, the Court does not read the claim as being limited to this configuration. Because the claim term uses common words in their common sense, and to avoid narrowing the claim, the Court agrees with iRobot that **the term “labyrinth seal” will be given its plain and ordinary meaning**. SharkNinja may choose to describe a labyrinth seal as maze-like, but may not suggest to the jury that being maze-like requires a certain degree of complexity. See Finjan, Inc. v. Secure Computing Corp., 626 F.3d 1197, 1207 (Fed. Cir. 2010) (“Unlike O2 Micro, where the court failed to resolve the parties’ quarrel, the district court rejected Defendants’ construction.”).

⁷ Multiple dictionaries provide “maze” as an alternate definition of “labyrinth.” For example, the Oxford English Dictionary defines the word as “[a] structure consisting of a complex network of tunnels, paths, etc., deliberately designed or constructed so that it is difficult to find one’s way through; a maze.” Labyrinth, Oxford English Dictionary Online, <https://www.oed.com/view/Entry/104763?rskey=hU9m0C&result=1&isAdvanced=false#eid> (last visited Jan. 12, 2021). Merriam-Webster defines the word as “a place constructed of or full of intricate passageways and blind alleys,” with “maze” as an alternate definition in the context of a garden maze. Labyrinth, Merriam-Webster, <https://www.merriam-webster.com/dictionary/labyrinth> (last visited Jan. 12, 2021). These definitions do not necessarily shed light on the parties’ positions, particularly due to the specification’s recital of a “simple labyrinth.”

**K. “Transmitting a power level report from the robotic cleaning device . . .”;
“transmitting a mission status report from the robotic cleaning device . . .”;
and “receiving, from the mobile device at the robotic cleaning device . . .”**

Patent (Claims)	iRobot’s Construction	SharkNinja’s Construction
’676 (Claims 1, 10)	No construction necessary	“sending a power level report from the robot over a communication link formed between the robot and a mobile device”
	No construction necessary	“sending a mission status report from the robot over a communication link formed between the robot and the mobile device”
	No construction necessary	“receiving at the robot a command to perform a cleaning operation at a user-selected cleaning power over a communication link formed between the mobile device and the robot”

Claim 1 of the ’676 patent describes an RVC that operates in part by “transmitting a power level report [or a mission status report] from the robotic cleaning device to a mobile device . . .” [ECF No. 97-19 at 17 (12:52–53; 12:57–58)]. Similarly, Claim 10 of the ’676 patent describes an RVC that can “receiv[e], from the mobile device at the robotic cleaning device, a command to perform a cleaning operation at a user-selected cleaning power.” [*Id.* at 18 (13:31–34)]. SharkNinja proposes claim constructions for the above claim terms that would make clear that when the robot and a mobile device exchange information, a “communication link” between the two devices is established, [ECF No. 97 at 22], and argues that the specification supports the existence of such a link, [ECF No. 101 at 24]. While SharkNinja acknowledges that, per the specification, a communication link between the devices could be established wirelessly or through a cable, [ECF No. 97 at 23], SharkNinja interprets the claims’ “from” and “to” language to exclude the possibility of a triangulating connector, such as the cloud or a network, that would intercept or facilitate communication between the devices, [ECF

No. 101 at 24]. iRobot contends that by the terms of the claims, no such “link” between the devices is required for them to communicate. [ECF No. 98 at 16]. Further, iRobot argues that the devices do not need to link directly to each other, but could link through a third device or means, such as the cloud or an ethernet/network connection. [Id. at 17].

It is clear from the claims that information is being transmitted to and received by the robot and mobile device, but SharkNinja’s proposed construction would import a requirement as to how that information is being communicated. The specification, however, describes a number of possible methods of communication, several of which could be accomplished without a direct connection between the robot and a mobile device. For example, the specification describes one embodiment in which a mobile device and robot would communicate by “linking 142 . . . either through a wireless connection, communication port, or direct connection.” [ECF No. 97-19 at 17 (11:42–45)]. A “wireless connection” is frequently mentioned but the specification does not state that the connection must be made without the use of an intermediary device, like a server or router. See, e.g., [id. at 14 (6:56), 15 (7:10–13), 16 (10:36–40)]. In addition, the specification recites a variety of potential communication devices that can communicate with the robot, including “a hand-held remote device, a PC, a laptop, and a wireless communication device,” all of which could correspondingly communicate with the robot in various ways, not limited to a direct connection. See [id. at 13 (3:60–63)].

In Rothschild Connected Devices Innovations, LLC v. Coca-Cola Co., the Federal Circuit reversed a district court’s claim construction where the district court interpreted a claim to require “*direct* communication,” so that communication over a wireless network was outside the scope of a claim. 813 Fed. App’x. 557, 563 (Fed. Cir. 2020). In discussing this error, the Federal Circuit stated that the claim at issue “does not include any language regarding the

permissible communication technologies or paths the user interface module can employ to enable communication between the user and the dispenser, much less any language differentiating between the user's pressing a touchscreen, transmitting the information over Bluetooth, or transmitting the information over a cellular network.” Id. The court therefore refused to read such limitations into the claim where “neither the . . . patent’s claims nor its specification limit such interaction to specific wireless communication technologies or paths.” Id.

Several district courts have taken a similar approach. One court has rejected a proposed claim construction similar to SharkNinja’s, which imported a limitation that communication between devices be direct, rather than through a server. Agis Software Dev., LLC v. Huawei Device USA Inc., No. 17-cv-00513, 2018 U.S. Dist. LEXIS 174041, at *77 (E.D. Tex. Oct. 10, 2018). In Agis, the claim at issue similarly discussed “a first device, receiving a message from a second device,” without describing how that information was being transmitted. Id. at *78 (emphasis omitted). The court found that, as here, “[d]efendants have not shown that anything in the claims warrants requiring that a message be received ‘directly’ and ‘without the use of a server.’” Id. at *78–79. Likewise, in a case with a claim term that involved transmitting information from a device to a computer, another court refused to adopt a proposed claim construction that would “construe the term and phrase as meaning ‘directly sending between the identified devices without use of an intermediate network.’” Papyrus Tech. Corp. v. NYSE, 581 F. Supp. 2d 502, 525 (S.D.N.Y. 2008).

In light of the language of Claims 1 and 10 and the specification, the Court reaches the same conclusion. Claims 1 and 10 are not limited to transferring or receiving information “directly” between a robot and a mobile device, which is a limitation that SharkNinja’s proposed “formed between” language would impermissibly impose. See Rothschild, 813 Fed. App’x. at

563. The claims and specification indicate that there is some connection, or link, between the robot and mobile device that allows for the transmission and receipt of information, but neither the claims nor the specification limit that to a direct connection or to a connection made through a particular method—Wi-Fi, Bluetooth, cellular network, cable, etc. Because the claim terms use common words in their common sense, and to avoid narrowing the claim, the Court agrees with iRobot that **the terms “transmitting a . . . report from the robotic cleaning device . . .” and “receiving, from the mobile device at the robotic cleaning device . . .” will be given their plain and ordinary meanings.** See Finjan, 626 F.3d at 1207.

L. “Mission status report”

Patent (Claims)	iRobot’s Construction	SharkNinja’s Construction
’676 (Claims 1, 4, 5, 11, 12)	No construction necessary	“a description of the status of a cleaning task”

Claims 1, 4, 5, 11, and 12 of the ’676 patent reference a “mission status report.” [ECF No. 97-19 at 17–18 (12:57, 13:10–11, 13:13–14, 13:36, 13:41–42)]. For example, Claim 1 recites a method of cleaning with a robot that involves “transmitting a mission status report from the robotic cleaning device to the mobile device . . .” [Id. at 17 (12:57–58)]. SharkNinja’s construction would limit “mission” to mean only a “cleaning task.” [ECF No. 97 at 24]. In addition, SharkNinja proposes that “report” be construed to mean something more than “status information.” [Id.]. iRobot counters this assertion, noting that the specification recites that a mission status report may include various types of information unrelated to cleaning, and that a report should not be limited to a description when it could be a simple indication that a task has ended. [ECF No. 98 at 15–16].

Claims 1, 11, and 12 do not reference cleaning at all. [ECF No. 97-19 at 17–18 (12:57, 13:35–37, 13:38–42)]. Claims 4 and 5 reference cleaning, but do not indicate that the mission status report communicates information exclusively about a cleaning task. [Id. at 18 (13:9–11, 13:13–14)]. The specification uses the words “mission” and “report” in various ways. In one instance, the full term, “mission status report,” is used to refer to a range of potential tasks, none of which is specific to cleaning: “e.g. mission completed/abandoned/battery depleted, etc.[]” [Id. at 15 (8:45–46)]. Nor does this use of mission status report suggest that “report” means a detailed description. See [id.].

Standing alone, “mission” is most frequently used in the specification to refer to tasks or actions in general and is not limited to cleaning tasks. See [id. at 13 (3:38–39) (referring to “the number and type of mission [the robot] should run”); id. at 15 (7:40) (mentioning a “mission or task” generally); id. (8:3–6) (discussing the initiation of “a preprogrammed mission or task”); id. (8:19–26) (referring to “pre-programmed missions, tasks, or actions” and noting that one such “task command[] 30 *could include* . . . carrying out a specific cleaning mission”) (emphasis added); id. at 16 (9:3–4) (referring to “a specific mission, task, or action” generally); id. at 17 (12:16) (reciting a “scheduled mission” without further description)]. The specification also uses the term “report” in a general, non-specific way. See [ECF No. 97-19 at 13 (3:66–4:3) (describing “information” that can be transmitted and listing a series of possible reports containing this information); id. at 15 (4:40–46) (listing “information” that could be sent to a communication device to include various reports, including “dirt compartment level status reports”)]. These instances do not suggest that a report must provide a detailed description of the information it is communicating.

Neither the claims nor specification indicate that “mission” or “report” should be limited in the way that SharkNinja proposes. See Groove Dig., Inc. v. United Bank, No. 2019-1857, 2020 U.S. App. LEXIS 28137, at *8 (Fed. Cir. Sep. 3, 2020) (stating that “a patent’s repeated and consistent description of a claim term may inform its construction”). Because the term uses common words in their common sense, and to avoid narrowing the claims, the Court rejects SharkNinja’s proposed construction. **The Court will therefore give the term “mission status report” its plain and ordinary meaning.** See Finjan, 626 F.3d at 1207.

M. “Power Level”

Patent (Claims)	iRobot’s Construction	SharkNinja’s Construction
’676 (Claim 1)	“battery level”	“battery level”

The parties agree that “power level,” contained in Claim 1 of the ’676 patent, should be construed to mean “battery level.” [ECF No. 96 at 8]. Courts are obligated to construe terms only when the parties present a dispute. See U.S. Surgical Corp. v. Ethicon, Inc., 103 F.3d 1554, 1568 (Fed. Cir. 1997) (“Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy.”); see also Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc., 200 F.3d 795, 803 (Fed. Cir. 1999) (stating that “only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy”); Amgen, Inc. v. F. Hoffmann-La Roche Ltd., 494 F.Supp.2d 54, 70 n.1 (D. Mass. 2007) (“Where the parties agree upon claim construction, that construction properly governs the course of subsequent proceedings just as would a stipulation of fact.”). The Court therefore adopts the parties’ agreed-upon construction of “power level” as **“battery level.”**

III. CONCLUSION

Accordingly, the claim terms at issue will be construed for the jury and for all other purposes in this litigation in a manner consistent with the above rulings of the Court. For ease of reference, the Court's constructions are reproduced below in Appendix A.

SO ORDERED.

January 14, 2021

/s/ Allison D. Burroughs
ALLISON D. BURROUGHS
U.S. DISTRICT JUDGE

Appendix A

Disputed Claim Term	Court's Adopted Construction
"Coulometry"	"Measuring the current constantly entering and leaving the power source"
"Detecting a need to recharge the energy storage unit"	"Determining a need to recharge the energy storage unit"
"Navigational control system configured to autonomously: control ... return ... dock ... recharge ... and then to continue"	"A navigational control system configured to perform the claimed sequence without human assistance or intervention"
"Removable"	"Capable of being detached without damage to the part or whole"
"A removable caster wheel assembly disposed on the chassis, the caster wheel being configured to turn about a vertical axis and roll about a horizontal axis"	"A support wheel assembly disposed on the chassis allowing the caster wheel to turn about a vertical axis and roll about a horizontal axis, wherein the complete caster wheel assembly can be detached without damage to the assembly or the robot"
"Service opening in a bottom portion of the cleaning bin"	"Service opening on the bottom surface of the cleaning bin"
"Disengaged from the station housing in a vertical direction relative to the station housing"	"Released from the station housing in a vertical direction"
"A bagless cyclonic vacuum configured to divert debris from an incoming flow using centripetal acceleration of the debris"	"A bagless vacuum structured to create cyclonic airflow to separate debris"
"Prevent spooled filaments from traversing axially beyond the extremity of the mounting feature about which the axial end guard is mounted" (claim 1) "Prevent spooled filaments from traversing axially beyond the extremity of at least one of the end mounting features" (claim 10)	"Prevent spooled filaments from going beyond the end . . ."
"Labyrinth seal"	Plain and ordinary meaning

<p>“Transmitting a power level report from the robotic cleaning device to a mobile device” (claim 1)</p> <p>“Transmitting a mission status report from the robotic cleaning device to the mobile device” (claim 1)</p> <p>“Receiving, from the mobile device at the robotic cleaning device, a command to perform a cleaning operation at a user- selected cleaning power” (claim 10)</p>	Plain and ordinary meaning
“Mission status report”	Plain and ordinary meaning
“Power level”	“battery level”